

Relation to International Standards

ISSUE 3: How should NRC requirements for non-light-water reactors (non-LWRs) relate to international codes and standards?

BACKGROUND:

Other countries have had experience with non-LWRs and continue to perform research and development on these technologies. The United Kingdom operates 14 advanced gas reactors, Japan recently began operation of a 30-megawatt high-temperature, gas-cooled research reactor, and China operates the HTR-10, a 10-MWt high-temperature, gas-cooled reactor (HTGR) prototype. Both the International Atomic Energy Agency (IAEA) and the European Union have active programs on HTGR safety and development. Accordingly, other countries and organizations have developed, to varying degrees, an infrastructure supporting non-LWR technologies, including the development of standards and requirements. In addition, many future reactor design and development efforts are being conducted via international partnerships and are intended to be marketed internationally. This has been the case with the pebble bed modular reactor (PBMR) and gas-turbine modular helium-cooled reactor (GT-MHR) and will likely be the case on other future efforts, including advanced LWRs.

NRC Management Directive 6.5, "NRC Participation in the Development and Use of Consensus Standards," provides guidance on and encourages the use of consensus standards, where practical. One of the objectives of this directive is to "Promote the efficient and effective use of NRC resources by focusing staff participation on the development of standards that address a defined current or anticipated regulatory need." This directive advises that staff should seek out existing consensus standards to address a need for new or revised technical standards rather than writing a Government-unique standard. In order to improve agency understanding of consensus standards, this management directive encourages staff participation in the development of consensus standards. In addition, this directive implements OMB Circular A-119 and states that "OMB Circular A-119 does not establish a preference between domestic and international consensus standards, but in the interests of promoting trade and implementing the provisions of international treaty agreements, international standards, such as those from the International Standards Organization and the International Electrotechnical Commission, are considered for agency regulatory and procurement applications."

The Commission has previously given staff direction which could be relevant to the level of involvement it expects with international safety standards and requirements. In an SRM from the August 14, 2001, briefing on NRC International Activities, the staff was directed as follows:

- "The staff should continue to look at all program areas where we can benefit from cooperation with the international community, including opportunities in the U.S."

The scope of this issue addresses the extent to which NRC should be proactive in developing and endorsing international codes and standards related to the safety of design, manufacturing,

construction, and operation of non-LWRs. This could include programmatic as well as technical codes and standards.

DISCUSSION:

Many future reactor design and development efforts are being conducted via international partnerships. These international efforts include design, manufacturing, research and development and marketing. With these international efforts comes the desire to harmonize the licensing requirements as much as possible. For NRC purposes, the international efforts represent an opportunity to build upon work done by others and to benefit from their experience. This would be of great value considering that much of the NRC's current regulatory infrastructure, technical knowledge, and experience is LWR oriented. However, any such effort to participate in or review international standards would require a stable commitment of resources.

The international codes and standards that could be of interest to NRC include both technical and programmatic areas. The IAEA has produced a number of standards pertaining to reactor safety. Additionally, the IAEA has produced documents dealing with regulatory issues such as the application of the defense-in-depth concept. The International Standards Organization (ISO) has also generated standards dealing with subjects such as quality assurance. International collaboration with other regulatory agencies and international standards organizations could be a useful way to identify the need for codes and standards and facilitate their development.

At the public workshop held October 22–23, 2002, participants agreed that the NRC must be involved at some level with international codes and standards because of the international nature of new reactor designs. There was general agreement that the NRC should review any international codes and standards referenced in applications and pre-applications. Additionally, stakeholders recommended that the NRC utilize the experience of other regulatory bodies to facilitate the review of international codes and standards. This recommendation came with the cautionary note that the NRC should not “rubberstamp” a standard simply because another regulatory body endorsed it. The workshop participants agreed that the NRC should be proactive in selected areas by participating in developing and endorsing international codes and standards that could fill critical gaps in NRC's infrastructure for non-LWRs.

OPTIONS:

The options considered by the staff in addressing this issue are:

- (a) Review international codes and standards only as part of an application or pre-application review.

This option would have NRC review international codes and standards only as necessary to review a licensing or pre-application submittal which incorporates such standards.

While this option is consistent with MD 6.5 and would provide some benefit from international experience by the fact that international codes and standards could be endorsed, it does not include NRC participation in their development (including exposure to the technical basis and experience supporting the standard) and thus cannot influence their outcome. Accordingly, the

NRC staff understanding will not be as great as it would be if staff was involved in developing the codes or standards. In addition, the codes and standards review itself as well as the resolution of any problems with the standards would need to be addressed as part of the review of an actual application or preapplication, thus potentially delaying the review process. This option would involve the least amount of resources.

- (b) Proactively participate in the identification, development, and endorsement of international codes and standards where such standards have been identified by the staff as being needed by applicants or pre-applicants for use in their submittals and can fill gaps in the NRC's non-LWR infrastructure.

This option would have NRC help identify, participate in, and endorse international codes and standards where such codes and standards are expected to be part of an application or are needed to fill gaps in our infrastructure. It allows NRC greater benefit from international experience than Option a by including involvement in the creation of the codes and standards. It also would contribute to the efficiency of the review of an actual application by reviewing and resolving in advance issues related to international codes and standards use. Additionally, it helps to fill gaps in the NRC infrastructure related to non-LWR reactors without requiring NRC endorsement of all existing international codes and standards, and it is consistent with Management Directive 6.5. If approved by the Commission, work in this regard would most likely be in technical areas associated with non-LWRs; however, programmatic areas may also be included, where international harmonization could contribute to agency effectiveness and public confidence. In implementing this recommendation, the staff would use the IAEA and the Nuclear Energy Agency (NEA) as resources to assist in the identification of codes and standards needs and in the understanding of international codes and standards. Application of this recommendation could also be considered for future LWRs in light of the international nature of many of the future LWR designs. However, in either case, implementation of this recommendation will require a stable commitment of resources over the next several years.

RECOMMENDATION:

The staff recommends that the Commission take the following action:

- Approve proactive participation by NRC in development of and endorsing international codes and standards where such codes and standards have been identified by applicants or pre-applicants for use in their submittals or by staff as needed to fill gaps in the NRC's non-LWR infrastructure.¹

This recommendation is consistent with Option b above. If approved by the Commission, the staff would proceed to develop a plan for proactive involvement in international codes standards activities consistent with the above.

¹Note: The staff believes that this recommendation is consistent with Management Directive 6.5, "NRC Participation in the Development and Use of Consensus Standards," November 1999.